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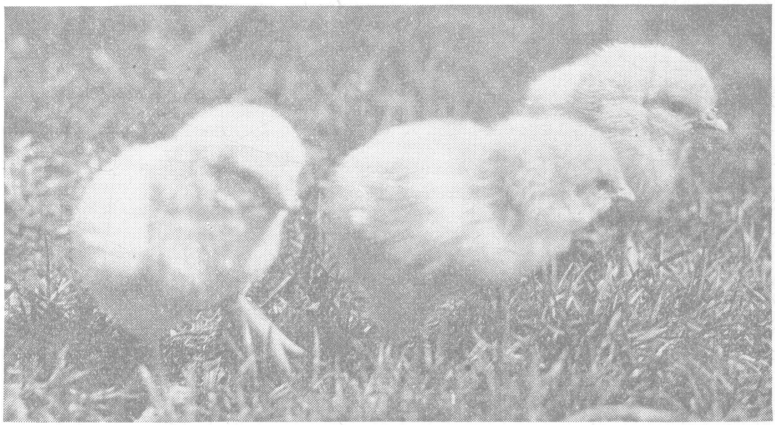
OHIO 4-H CLUB WORK

Motto:—"To Make the Best Better"

POULTRY CLUB CHICK REARING

How to Raise the Chicks



Only one out of three birds gets in the laying pen

By

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HOW TO RAISE THE CHICKS

STARTING IN THE POULTRY BUSINESS

Success in the poultry business even on a small scale depends largely on laying a firm foundation at the beginning. The fundamental factors that the beginner should be sure to meet are: (1) secure good, vigorous, well-bred stock; (2) secure the stock at the right time; (3) properly grow and develop the stock; (4) maintain sanitary conditions so that disease and parasites never become a problem; (5) know what and how to select the good stock in the flock.

These factors are fundamental because unless they are properly met, equipment and management will have little effect on the success of the venture. Hence the start is all-important.

The easiest way to start is to secure baby chicks, but where the incubator equipment is available it is cheaper to purchase the eggs and hatch the chicks. Another good method is to purchase the parent stock and produce both the eggs and chicks.

The basis on which the method of securing stock is determined should be solely a matter of obtaining the best possible start.

QUALIFICATIONS OF FLOCK PRODUCING HATCHING EGGS

Breeding from hens that have completed at least one year's lay and have been rigidly culled insures breeding from high producing birds. It also allows time in which to detect and dispose of hens that are consistently broody or show any other undesirable characteristics so that the tendency may be avoided through proper breeding methods.

Further, only the strong, vigorous birds in the flock lay a large number of eggs and maintain their health, so that the mortality of the flock may thus be kept to a minimum by breeding these vigorous birds. Since it is impossible to tell anything about these characteristics in a pullet flock at the season that they would be used for breeding purposes, it is desirable to use yearlings for the breeding pen.

The breeders should be selected during the fall months because their characteristics are more easily read at that time and the birds disposed of make room for pullets. The breeders selected should meet the standard requirements for the breed and be good producers. The males are half the mating and should be selected with care. If, in addition to good physical characteristics, the male has a pedigree, the mating is so much the better.

CARE OF THE FLOCK

Strong, fertile eggs are necessary to make it profitable to hatch the chicks. Such eggs can best be produced by stock which is properly mated and kept under the best possible conditions to insure the maintenance of health and vigor. One male to every fifteen females in the American breeds, and one male to every twenty females in the egg breeds, is shown to be the proper proportion of males to females.

Hens that are allowed to get in an overfat condition usually produce eggs that hatch very poorly. The breeders should be allowed free range, and fed a balanced ration of grain, mash, milk, and green feed. Milk and green feed are very essential if it is necessary to keep the birds confined.

The males should be placed with the flock at least two weeks before the eggs are saved for hatching. The American breeds should be hatched by April 15 and the Leghorns by May 15. This is the latest date to hatch and not the earliest. Remember that the early hatched cockerels sell for the high broiler prices, and that the early hatched pullets produce eggs during the season of high prices.

SELECTION AND CARE OF HATCHING EGGS

Not every egg collected is suitable for hatching. They should be carefully selected for uniformity of size, shape, and color. All thin shelled or rough surfaced eggs, as well as those that are too small, too large, or dirty, should never be set.

Eggs should be gathered at least twice daily and oftener during cold weather and stored in a dry place at a temperature of about 65° Fahrenheit. Eggs should not be saved more than two weeks and should be turned at least once each day. Egg cases with hinged covers make an excellent receptacle in which to store the eggs; they may be turned by simply turning the case.

NATURAL INCUBATION

Hatching eggs under hens is fast becoming obsolete because of the work it requires, its tediousness, and the limited capacity. It also takes the hen from her business of producing eggs.

Where hens are used for hatching they should be thoroughly dusted with sodium fluoride for lice, and the nests put in a place free from mites and protected from rats.

The hens should be allowed to leave their nests regularly for a short period daily and fed grain, green feed, and water.

ARTIFICIAL INCUBATION

There are a large number of reliable makes of incubators on the market, and it is probably best to select an incubator that is giving satisfaction in your community, so that you may profit by the experiences of other operators.

Manufacturers carry on experiments to determine the proper method to operate their machines. It is advisable, therefore, to follow as closely as possible the method outlined by the manufacturer of your machine. Especially is this true of the temperature at which the incubator should be operated, as it depends so much on the location of the thermometer. Always test the thermometer each spring to see that it is correct.

A high temperature will make the eggs hatch too early and produce weak chicks, while a continuous low temperature throughout the hatch will delay it several hours and produce weak chicks.

Use the best grade of oil or coal as determined by the type of the machine. If a lamp is used, clean and fill it daily, trimming the wick by scraping the charred portion off with a knife or by cutting the wick with scissors. Keep the burners free from dirt and thoroughly clean by boiling after each hatch. Use a new wick for each hatch. Always run the machine for 4 or 5 days previous to putting the eggs in, so it will be properly regulated and thus lessen the danger of spoiling the hatch.

Start turning the eggs on the third day and continue to turn daily until the eighteenth day. After turning the eggs, reverse the egg trays end for end and change from one side of the machine to the other.

Test the eggs on the seventh and fourteenth days. Remove all the eggs that are infertile and have dead germs, and save them to boil and grind for chick feed.

The incubator should be set level and the cellar should be well ventilated, but no drafts allowed to strike the machine.

BUYING DAY-OLD CHICKS

Think only of quality when buying baby chicks. Ten-cent chicks are like ten-cent hammers. Buy the chicks near at home and see the parent stock, so that you will be certain of getting chicks from a vigorous, healthy, high-producing strain, and chicks that are true to breed and type. Buy chicks from Ohio Certified Flocks or Ohio Accredited Hatcheries, and be sure of the quality of the stock that you are purchasing. It is often better to purchase eggs from flocks that are known to be good producers and have the eggs hatched for you if you are not in position to do it yourself.

BROODING

Proper brooding of chicks is the foundation for profitable egg production. It has been well said that a strong chick properly hatched is half reared, but the strongest of chicks cannot survive faulty brooding without serious injury. If the chicks are poorly brooded, no amount of care afterwards will correct the damage done during this critical period.

Chicks should be secured early in the season and all at the same time, so that it is not necessary to put different ages under the same stove.

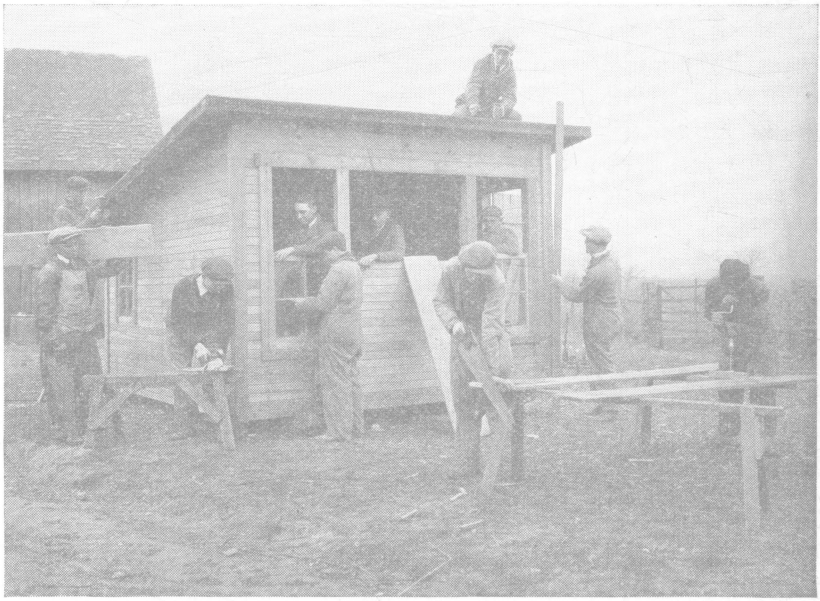

Fig. 1.—Even club members can have good brooder houses

MOVE BROODER HOUSE TO NEW GROUND

It is always desirable to raise chicks on new, uncontaminated ground. The brooder house should be movable and dragged to new ground every year, even if only a short distance from where it previously stood. The object is to have sod immediately around the house, as a grass range is an important factor in the rearing of chicks.

The old bare spots where the house formerly stood should be limed and seeded, if necessary, to get a sod. A good growth of alfalfa, clover, or bluegrass insures a liberal supply of green feed, is much more sanitary than bare ground, and is an insurance

against disease. It is in the filth on these bare spots that the coccidiosis and other disease germs live from year to year.

PREPARATION OF THE BROODER

The brooder house should be thoroughly cleaned and sprayed with some coal-tar disinfectant or whitewashed. The brooder stove should be overhauled, cleaned, and fire started in it four or five days before the chicks arrive so that the temperature may be properly regulated. This practice also warms and dries the house thoroughly by the time the chicks are moved into it.

The floor of the brooder should be covered with from ½ to 1 inch of clean and rather coarse sand. This furnishes grit of the desired size and keeps the floor in a more sanitary condition. Litter of some kind should then be put on top of the sand in the form of either clover or alfalfa leaves or finely cut clean straw. One inch of litter is enough for the first few days, then more should be added as the chicks get older.

Moldy or spoiled litter must be avoided or serious loss of chicks will result. Litter induces the chicks to scratch for the grain, thereby helping to avoid tail and toe picking, and is a valuable absorbent for excessive moisture. The sand and litter, of course, should be removed when it becomes foul or damp, and fresh litter supplied.

If using a coal brooder, hard coal is most satisfactory. Enough coal of a good grade should be secured before the brooding season starts.

TRANSFERRING THE CHICKS TO BROODER

The chicks should not be removed from the incubator until at least 36 to 48 hours have elapsed after the last chick is out of the shell. This gives them a chance to dry thoroughly and to get hardened before being transferred to the brooder. It also gives them time to digest the egg yolk which is taken into the body just before they are hatched, and which furnishes nourishment for a considerable length of time. To remove the chicks from the incubator as soon as hatched and feed them immediately will surely result in digestive troubles.

A good time to remove them is in the early afternoon so that they can be watched awhile before darkness comes on. In removing chicks to the brooder they should be protected from the cold, because chilling always results in bowel trouble. A box or basket lined with cloth and a like covering for the top will serve as a means for transferring the chicks from incubator to brooder.

When the chicks are moved to the brooder the temperature should be above 100° Fahrenheit, 1 foot from the stove and 2 inches above the floor under the hover. It is important that the brooder house be large enough so that the chicks can get to a cooler place during the day, if they so desire.

For the first few days, in order to prevent them from crowding in the corners and chilling, it is advisable to have a wire netting arranged about 2 or 3 feet outside and around the hover to form an inclosure. This inclosure may be enlarged a little each day, so that finally it only keeps the chicks from crowding in the corners of the house. This screen can be of ½-inch mesh hardware cloth, 1 foot wide, and of length to suit the needs.

The temperature should be regulated according to the action of the chicks, but ordinarily it may be reduced about 5 degrees a week. See to it that there is plenty of heat to keep the chicks warm under the hover, with enough room outside of the hover for them to get away from the heat. Usually no artificial heat is needed after 8 or 9 weeks.

NUMBER OF CHICKS TO EACH BROODER

A common mistake is to place too many chicks under one brooder. At least one square foot should be allowed for every four chicks; that is, a 10 by 12-foot or 12 by 12-foot brooder house with a large coal-burning stove will take care of 500 chicks. A much larger percentage of chicks will be raised if only 300 or 400 chicks are placed in the house.

It is always advisable to buy the larger coal-stove brooders even though they are to accommodate but 200 chicks. They have a larger fuel capacity which simplifies the problem of maintaining the desired temperature during the coldest nights, as well as having a reserve heating capacity when required.

GET CHICKS ON GROUND

If the weather permits the chicks should be out on the ground when they are a week old. For the first week or two they should be confined to a small area close to the house and protected from strong winds by placing burlap bags or cornstalks around the enclosure. By keeping them in the enclosure the chicks will learn to know where the heat is and also where they belong.

If the weather is such that the chicks cannot be on the ground for the first two weeks, 2 per cent of cod-liver oil should be added to the regular mash or at least a raw egg fed daily to every thirty chicks.

CHICK FEEDS

DIETARY ESSENTIALS

Too many chicks die at an early age as a result of improper feeding. Chicks are sure to die or fail to grow properly if they do not receive certain dietary essentials required to meet their needs for rapid growth. In other words, they must have a complete ration.

A complete ration embodies the following essentials: fats, carbohydrates, proteins, fiber, mineral matter, and the vitamins. The most vital of these are proteins, minerals, and vitamins, of which every ration is deficient unless liberally supplemented with milk and green feed. The welfare of every flock of chicks is vitally dependent upon these essentials.

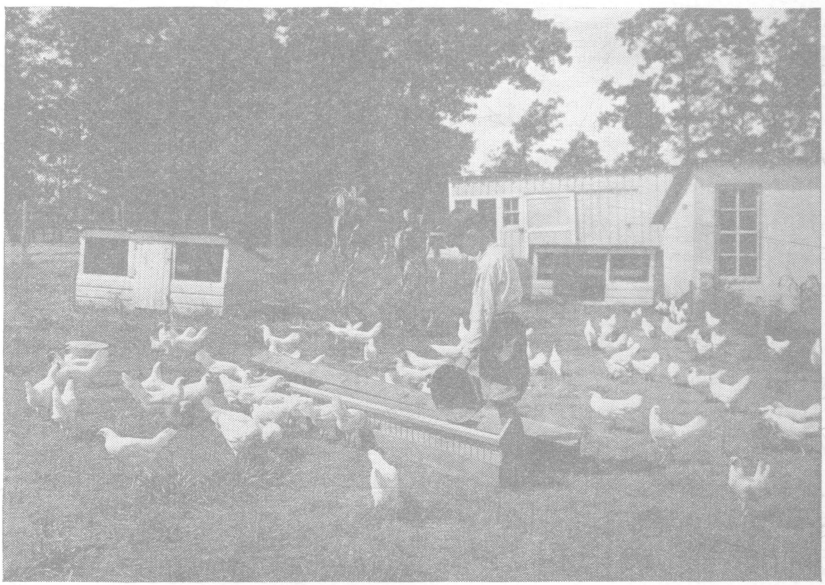

Fig. 2.—Summer care means winter eggs

MILK

Practical poultrymen and investigators are agreed that no ration for chicks is complete unless it contains milk. Milk is the simplest, the cheapest, and the most effective means of supplying the vital factors mentioned above. In addition, milk has the added power of stimulating the appetite for other feeds. Exhaustive experiments have shown that milk will cut down the mortality rate from all causes, hence it is poor economy to neglect to supply an abundance of milk.

Skimmilk or buttermilk are the forms easily available to most poultrymen and are the most satisfactory to feed. Where either of these forms is not available semi-solid buttermilk should be procured. This can be purchased in either 100-pound kegs or 500-pound barrels.

Start feeding milk as soon as the chicks are in the brooder. By all means see to it that milk is available until the chicks are eight weeks of age. It is also desirable to continue its use throughout the summer.

It is very dangerous to feed sour milk in galvanized containers, as the acid of the milk unites with the metal and produces a very bad poison.

GREEN FEED

Green feed is second only in importance to milk. It promotes growth and is undoubtedly a valuable insurance against digestive disorders and faulty nutrition. This is especially true when the weather prevents the chicks from running at large on the range.

The proper feeding of green feed is often neglected. It must be the kind that is relished by the birds, so that they will eat large quantities. It is also necessary to cut it fine so that it can be readily eaten, thus helping the chicks form the habit of eating it freely during the second week in the brooder.

A common mistake is the idea that if the chicks are on range they need no other green feed. Sometimes the range becomes picked over and depleted of succulent material, and in such cases additional green feed should be fed.

There are a number of green feeds which may be used, such as alfalfa, clover, sprouted oats, dandelions, lettuce, and chickweed. Sprouted oats is perhaps the best source early in the spring. While the chicks are young these sprouts should be cut in short lengths. As soon as clover or alfalfa is available it may be used.

RATIONS

Scratch Grain

First six weeks:	Parts
Fine cracked corn (yellow)	2
Cracked wheat	1
Pinhead or rolled oats	1
After six weeks:	
Medium cracked corn (yellow)	3
Whole wheat	1

Mash

First week:

Bran or standard middlings

Second week to maturity:	Parts
Ground corn (yellow)	4
Bran	2
Standard middlings	2
Meat scraps or tankage	1

(Meat scraps or tankage 2 parts when milk is not available.)

METHOD OF FEEDING

Scratch Grain.—During the first day or two the scratch grain should be fed on sheets of paper or plates of some kind. In this way all of the birds learn to eat at one time. After this, the grain may be fed in the litter.

During the first 10 days the grain should be fed sparingly five times daily. Gradually the number of feedings may be decreased until the chicks are four weeks old, when night and morning feed only is given. As soon as the chicks are out on range the grain may be hopper-fed, available at all times.

Dry Mash.—Dry bran or standard middlings should be available after the third day in shallow boxes or pans. After the eighth day the mash as given above should be fed.

If the weather is such that the chicks need to be confined very long, or trouble is experienced with leg weakness, 2 per cent of cod-liver oil should be added to the mash.

After the chicks are three or four weeks old the box part of the regular mash hopper is very good. Remove the reel so the birds can get into the feeder to eat. Any long, open hopper about a foot wide and deep enough that they cannot scratch the mash out is satisfactory.

Skimmilk or Buttermilk.—These should be available at all times from the very beginning and up until eight weeks nothing else should be given to drink. After eight weeks water may be given, or they may be on range where they will get it anyway. If milk is not fed after the chicks are eight weeks of age, the meat scraps or tankage should be increased as noted.

Green Feed.—Give all they will eat after the first week.

Oyster Shell and Grit.—Keep in hoppers always available.

BABY CHICK TROUBLES

The largest per cent of losses in the flock occurs during the first 6 weeks of life. Not only this loss, but future losses may be kept to a minimum through a little additional attention to the chicks during this period.

Large colony brooder stoves have made it possible to raise chicks in larger numbers and with less labor than was possible with the old hen, but they have caused several problems to arise that were not experienced when the care of the chicks was left to their "natural" mother.

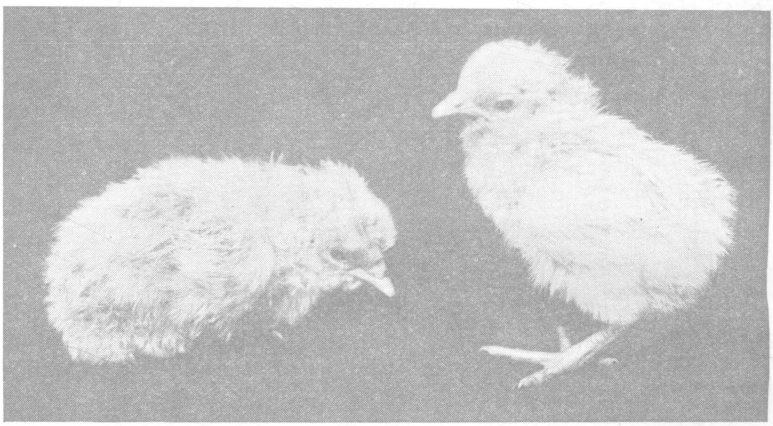

Fig. 3.—Weak chicks never prove satisfactory

CROWDING

One of the large losses among chicks that are brooded artificially results from crowding. If for any reason the chicks become chilled they are apt to crowd together in order to keep warm. This piling up usually results in the death of several chicks on the bottom of the pile. Even though they do not die they will be stunted. Their digestive systems will be so upset that they will not eat as they should and growth will stop. The lowered vitality which results will cause the chicks to be susceptible to many diseases and ailments which do not affect strong, healthy chicks. Following are some practices which will do a great deal to reduce the losses from crowding.

1. Do not try to brood too many chicks together. The capacity of many of the brooder stoves on the market is overestimated. For best results not over 400 chicks should be brooded together.

2. Run the brooder stove four to five days before the chicks are to be put in the brooder in order to be sure that the temperature

is properly regulated. Avoid extremes in temperatures! At the start have a temperature of 100° Fahrenheit under the edge of the hover; this allows the chicks to move closer to the stove if it should cool off during the night. The brooder house should be large enough so that in case the stove becomes too hot the chicks can move away from the heat. Care should be taken, however, not to allow the stove to get so hot that the chicks go to the corners of the house, because when the stove cools off the chicks will often remain there, and will crowd together in an attempt to keep warm.

3. Round off the corners of the house with wire, boards, roofing paper, or by stuffing straw in them to remain throughout the brooding season. This will prevent the chicks from piling up in the corners.

4. Late in the brooding season when it is no longer necessary to use the stove continuously there will be several cold nights when it will be necessary to start a fire in the stove. If this is not done the chicks will become chilled and will crowd.

5. Teach the chicks to roost early. This can be started when the chicks are about a month old. Place the roosts about 8 inches above the floor. Nail chicken wire to the underside of the roosts to prevent the chicks from falling through. Construct the roosts so that the chicks cannot get under them. Gradually raise the roosts as the chicks become older.

DIARRHEA

There are two kinds of diarrhea which affect baby chicks; bacillary white diarrhea and ordinary white diarrhea.

BACILLARY WHITE DIARRHEA

This is an infectious disease and is transmitted to the chick by infected hens. The only satisfactory method known at present to overcome this disease is to remove the infected hens. This necessitates testing a sample of blood from each hen.

ORDINARY WHITE DIARRHEA

This is often mistaken for bacillary white diarrhea. This form of diarrhea is caused by the following conditions:

Overheating.—The brooder stove may get so hot that the temperature in the house is too high in the coolest corners. This throws the chicks off feed and results in a large number becoming "pasted up." A high mortality usually results and all will have a weakened vitality.

Chilling.—The results of chilling are the same as those of overheating. Careful attention to the operation of the brooder stove is the only prevention.

Improper feeding.—Feeding the chicks too soon causes diarrhea. The egg yolk enters the chick's body shortly before the chick hatches. The chick should have time to use up this yolk before it is given any other feed. If the chick is fed before the yolk is absorbed, the yolk will remain in the body and decay or putrify, causing the digestive system to be upset, and diarrhea will result. For this reason the chick should not be fed for at least 48 hours after hatching.

Sour skimmilk or buttermilk kept before the chicks at all times will help prevent diarrhea. If liquid buttermilk or skimmilk is not available, it will pay to buy condensed semi-solid buttermilk at least for the first six or eight weeks of the chick's life. This is now available at several points in Ohio and is being fed on many farms. Milk should not be fed in galvanized containers because of the possibility of poisoning.

The only satisfactory treatment after the chicks become affected is to give them Epsom salts. This should be given in the drinking water at the rate of 1 pound of salts to 4 gallons of water. This should be kept before them for one day, giving fresh water in the late afternoon of the day treatment is given.

CANNIBALISM

In order to get pullets that will lay during the winter months it is necessary to brood chicks at a season of the year when they must be confined to the brooder house most of the time. Under such conditions there is apt to be some trouble with the chicks eating one another. This habit usually starts when one chick accidentally pulls the toe nail off another. The blood attracts the other chicks, with the result that they start picking at this chick and then at the others, until several chicks may be so chewed up that they die. In addition to toe picking, they may develop the habit of picking the tails and wings also. If this habit is not stopped the mortality is apt to be quite high.

The remedies and prevention of cannibalism are:

1. Do not place too many chicks in one brooder. The habit is most frequent in flocks that are overcrowded.

2. Keep sour milk before the chicks from the start. This furnishes animal protein, the craving for which they may try to satisfy by eating the other chicks if it is not supplied.

3. Get the chicks out of doors as soon as possible, even though it be for only an hour at a time.

4. Give the chicks green feed such as sprouted oats, dandelions, and vegetables, chopped fine. This not only furnishes a succulent feed but also helps to keep the chicks busy.

5. Place chunks of green sod in the house. They will eat the green leaves and tender roots and will also be kept busy.

6. When the habit has been formed the feeding of fresh pork liver may help to cure it. Cut the raw liver into small pieces and feed all the chicks will eat. This not only serves as food which they crave, but also helps to keep them busy.

7. Painting the bleeding parts with tar, thus covering up the blood, will sometimes break up the habit. It is safest, however, to remove such chicks until the wounds have healed.

LEG WEAKNESS

Leg weakness is common in early hatched flocks that are kept confined for several weeks. This ailment is due to a deficiency in the ration, resulting in improper development of the bones.

Leg weakness can be prevented by feeding cod-liver oil or egg yolk to the chicks. Cod-liver oil should be mixed in the mash at the rate of 2 per cent of the mash. This should be mixed fresh once a week, as the cod-liver oil loses its strength.

In feeding eggs, boil and chop up fine the infertile eggs and eggs with dead germs from the incubator and feed in a moist mash 3 times daily, giving what they will clean up in a short time. The eggs should make up 20 to 30 per cent of the mash.

The feeding of cod-liver oil and eggs is an emergency measure and is necessary only while the chicks are confined. When the chicks can get outside, the sunshine has the same effect.

In addition, care should be taken to avoid floor drafts, damp floors, and overheating, as these may also cause leg weakness.

COCCIDIOSIS

Coccidiosis is the cause of very large losses in chicks from 4 to 12 weeks of age. The chicks lose weight, become thin and listless, the feathers are ruffled and dirty. The shanks and beaks become white. Occasionally blood is passed in the droppings, and the birds grow thin and die. Examination shows caeca enlarged, filled with hard, yellow, cheesy material and the intestines inflamed.

It is an infectious disease, and is caused by the presence of minute parasites in the intestines. This disease is spread through water, feed, or soil that has been contaminated by the droppings of infected chicks. These parasites will remain alive in the soil for a year or more. The best known treatment is sanitation, moving of the brooder house to fresh ground, and feeding nothing but milk for 2 days, then milk-moistened mash for 2 weeks. Kill all bad

cases, and feed Epsom salts at the rate of 1 pound to every 400 pounds of birds, once a week until improvement is noted.

GAPES

Gapes is caused by a parasite which attaches itself to the membranes of the air passages, and death usually results from suffocation. This parasite passes part of its life history in ground worms, and one preventive is to move the chicks to ground where chicks have not been raised.

INTERNAL PARASITES

Internal parasites cause a large amount of loss in growing chicks, either by stunting growth or, in the more severe cases, by causing the death of the affected birds. This becomes a more serious problem if chicks are reared on same ground year after year.

Symptoms.—The affected birds are thin and emaciated, the feathers may become ruffled, and slow growth and development are obvious. These are general symptoms; the only certain means of detecting worms is by postmortem examination of the intestines.

Treatment.—(1) Move the chicks to fresh ground; (2) feed tobacco dust in the mash at the rate of 2 per cent of the mash. Keep the tobacco in the mash as long as the chicks have worms. Do not buy too much tobacco at one time, as it loses its strength.

Give a dose of Epsom salts occasionally at the rate of 1 pound to 4 gallons of water.

LICE

Where the chicks are brooded by hens the hens should be dusted with sodium fluoride when first put on the nest and again before the chicks start hatching. Instead of dusting, a small amount of blue ointment may be applied in the region of the vent.

If chicks are brooded artificially there should be no trouble with lice provided the brooder is kept clean and sanitary. The only treatment for chicks that have lice is to apply one drop of vaseline or grease to the top of the head. Care should be taken not to apply too much, as it often does more harm than good.

SORE EYES

One form of eye trouble in baby chicks resembles contagious eye roup in fowls. This is due to a deficiency in the ration, and may be prevented by furnishing a plentiful supply of green feed. It will be necessary to supply green feed to chicks on range in case the grass on the range is dried up or too tough for the chicks to eat.

Eye trouble may be caused by irritation due to dust becoming lodged in the eye. This can be prevented by keeping the floor of the brooder house clean and by using clean litter.

SUMMER CARE

The job of growing a flock of high-producing pullets is not finished when they are past the brooder age. Many of the good flocks successfully raised to 10 weeks of age are stunted and utterly ruined for egg production by their care during the next two months.

SEPARATE THE SEXES

The first thing that should be done is the separation of the cockerels from the pullets. This should be done at from six to eight weeks of age. There are several reasons for this.

1. The pullets are the most valuable crop and should be given every opportunity to develop properly, which they will not do if the cockerels are left with them.

2. The cockerels will be ready for the broiler market sooner by putting them by themselves and fattening them for a short period; ordinarily the broiler market declines as the season progresses, hence the advisability of getting the broilers on the market as soon as possible.

3. The brooder house at this stage is becoming very crowded and, since it will not properly house all the chicks, there is the necessity for removing some of them.

SELECTING THE BREEDERS

When the cockerels are separated the likely looking breeders should be selected, if outside breeding males are not to be obtained. Select the rapid developing, short-legged, deep-bodied, smooth, broad-backed cockerels that show indications of vigor in their heads and in general appearance. These breeders may be left with the pullets if not too numerous.

FATTENING THE MARKET BROILERS

The cockerels for market should be put in a pen or in fattening crates and fed for 10 days to 2 weeks, depending on their condition. The following rations are recommended:

No. 1	No 2	No. 3
Ground corn, 7 parts	Ground corn, 3 parts	Ground corn, 3 parts
Middlings, 3 parts	Ground oats, 1 part	Standard wheat middlings, 1 part
Bran, 1 part	Ground wheat, 1 part	

To this mixture add skimmilk or buttermilk so as to make a batter the consistency of pancake batter. The mixture should pour readily from a pail. This ordinarily requires about 60 per cent

milk by weight. An addition of 10 per cent tankage, meat scrap, or soybean meal will yield even greater gains. The broilers should have access to this mixture for 20 minutes twice each day.

RAISE THE YOUNG STOCK SEPARATE FROM THE OLD

It is very unsatisfactory to raise the young stock with the old stock, as the latter will get most of the mash and grain feed. The old birds will tramp on the young ones and pick and worry them so they will not grow as well.

Usually the ground that the old hens roam on is quite bare and contaminated with years of filth, making conditions entirely unsatisfactory for growing young stock.

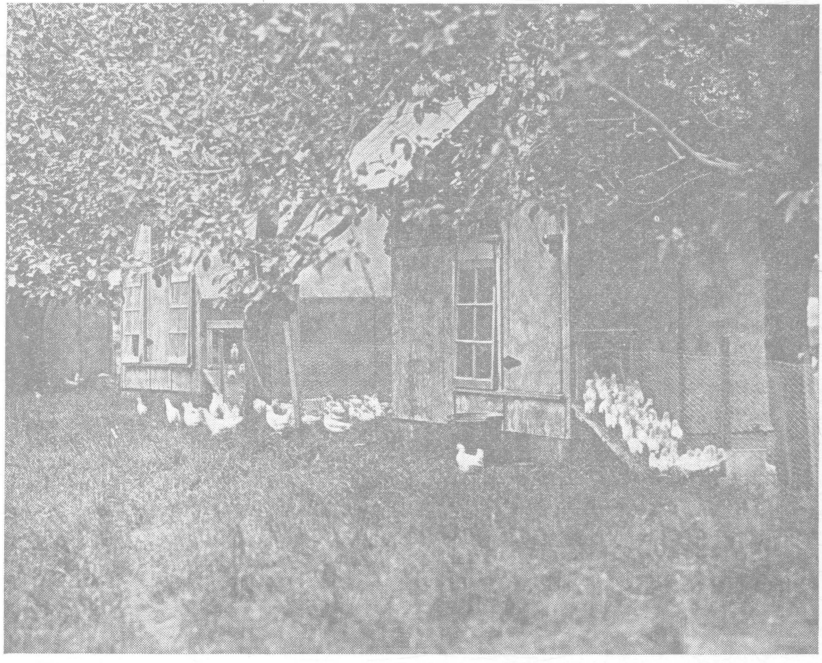

Fig. 4.—An ideal situation

RANGE

A good range is one of the most important requisites in rearing vigorous pullets. The growth of the flock is always better, there is less disease, and the labor is not so great because of less need for carrying green feed. An alfalfa range is ideal, but a good sod of clover or blue grass is satisfactory. It is advisable to move the brooder house every season or even during the same season if

disease is present, or the range becomes depleted. All houses used for brooding purposes should be built on skids with a board floor, so that they may easily be moved.

Where necessary to cultivate the range, it should be divided into two lots, with one lot growing a crop while the other is being ranged. The old range should be limed whenever the house is moved or when reseeded. Chicks respond to a fresh range, where there is an abundance of green feed, in a way not obtainable in any other manner. Farmers who have a new range each season experience very little trouble with disease, particularly coccidiosis.

SHADE

Some kind of shade should be provided during the hot weather. Low-branching shrubs are most desirable, and seem to be preferred by the birds. Where there is no natural shade the brooder house should be blocked up off the ground far enough to furnish shade. Old sacks or branches are sometimes utilized in making artificial shade.

SUMMER HOUSING

If the brooder house is not crowded to start with, it should properly house the pullets after the cockerels are removed at from six to eight weeks. The house should be well ventilated, and all windows removed during the hot weather. The rear of the house should be kept open in summer in order to provide sufficient air for the continually increasing needs of the birds. If this is not done the pullets will most surely hunt some cool place to roost. There is no reason why chicks should not roost in the trees in the summer unless there is danger of stealing, or unless it will result in damage to the trees.

The house should be light and easily cleaned. Spraying once a month with some good coal-tar disinfectant is advisable, and where there is trouble with mites the roosts should be painted with thick oil. Old engine oil is satisfactory. It is a good plan thoroughly to oil the roosts when they are first put in.

Clean litter should be put in the house as often as needed, this depending on how large the house is and the number of birds. The dirty litter should then be hauled away from the pullet range. Spraying should immediately follow cleaning. Roosts should be placed in the house at an early date. Early roosting helps to prevent crowding and smothering, allows better ventilation, and prevents overheating.

FEEDING THE GROWING STOCK

A complete and balanced ration is needed if a rapid and proper growth is to be obtained. Pullets do not lay until they are mature or very nearly so. They cannot lay a large number of eggs unless they are brought through in the best of condition. Fall eggs are high in price, hence the necessity for rapid growth as well as good condition. Improper feed results in underdeveloped pullets which it has been definitely proven are incapable of producing as many eggs as well-developed pullets.

Milk should still be provided in abundance if at all available. It furnishes the most satisfactory form of protein, gives quicker growth, and means less disease. Many poultrymen give nothing

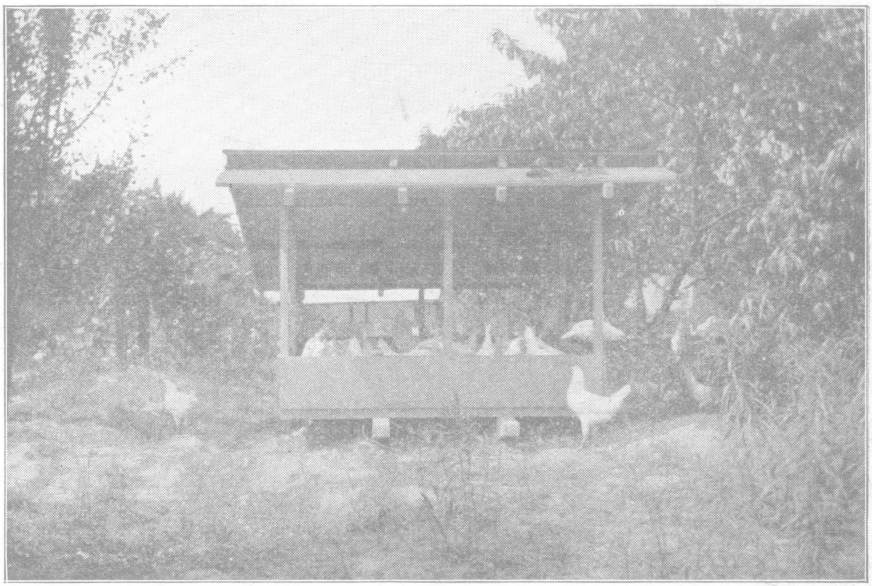

Fig. 5.—A labor-saving mash hopper for pullets on range

to drink but milk during the growing season, with the very best of results. Others think that during the hot weather, water should also be supplied. All agree, however, that some milk should always be available.

Green feed is indispensable for the best results, and should be provided in some form. If not available on the range, it should by all means be provided otherwise in large amounts. Almost any kind that is relished by the birds is satisfactory.

The same mash and grain as the chicks receive through their earlier life can be fed until the birds are in their laying quarters.

HOW TO FEED

Mash should be available at all times. Some kind of a hopper should be provided that can be set outdoors under the trees, that is large enough to take care of the number of pullets on the range, and is protected from the rain so that it will not have to be taken in every time it rains. Mash which becomes wet and moldy is dangerous.

The mash hopper shown on page 20 is being used with splendid results. This is 6 x 8 feet, with a 12-inch board around to hold the mash in. The roof should be low enough to keep the rain out. The grain can be mixed with the mash and fed in this same hopper if desired. A hopper of this size will hold in the neighborhood of 500 pounds of mash, and reduces the labor of filling hoppers so often.

The grain can either be fed in hoppers or hand fed. When hand fed, it necessitates a trip twice a day to the range, which is advisable; and if hand feeding accomplishes this, which would otherwise not be done, it is a good thing. Both hand feeding and hopper feeding of grain are used with equally good results.

Late in the season, if the grain or mash consumption needs to be increased or decreased to get the pullets in the proper condition, it can be accomplished best by regulating the amount of grain fed, since the birds prefer grain to mash. Either can be withheld, if necessary.

DRINK

Something to drink should be available at all times. Some prefer nothing but milk, others both milk and water. During hot weather an enormous amount is consumed by the birds. Where water is given, it is often possible to locate the brooder house on desirable ground near a spring or creek. This cuts down the labor of carrying water and always furnishes a fresh supply. Where water must be hauled, a convenient method is to use a large barrel which is so arranged that there is a continual drip into a vessel of some sort.

SELECTING THE EXHIBITION TRIO

Pick out the best three pullets. These three should be large, growthy, active, well feathered fowls, having broad backs, deep bodies, and stocky shanks. They should be typical of the breed, and uniform as to color, feathering, and comb points.

These chickens should not have off-colored feathers, foreign color in the face or on the shanks, and should not have any feathers on the shanks between the toes, except in the feathered shank breeds. If you find any such, they should be promptly removed, in case you cannot find a satisfactory bird without them in your flock.

In the past, too much emphasis has been placed on fine feathers when judging poultry of club members. Definite steps are being taken to have poultry judged more from the useful standpoint than from the fancy points of the poultry. This will mean that size and general vigor of the fowls will play a very important part in the judging, in future.

Experience has taught us that birds that grow a very fine and fancy coat of feathers may be poor egg producers. This does not mean, however, that fine feathers will not play any part, for the feathering must be uniform, else the birds are mongrels rather than purebred; but it does mean that other points such as size and shape of body and legs, color of face, etc., will be given a more important place in judging. The following points should be taken into consideration in selecting the trip for exhibit:

Body Type.—A bird of good body is usually well balanced in that the body itself must be deep, showing a nearly rectangular form, well developed breast and abdomen. Great depth of body is desirable, but apparent depth must not be due to loose feathering, which is generally shown by an evidence of loose thigh feathers.

Large capacity is designated by a body that is deeper at the rear end of the keel than at the front end. The underline should be fairly straight and the back should be comparatively horizontal. Prominent breast development, with evidence of a long keel, are desirable qualities in a high-producing hen. A male shows the same general characteristics as a female except that the abdomen is not so deep.

Head and Adjuncts.—One of the best indications in picking high layers is the fineness of the head. The head of the heavy producer is fine, showing a lean face, free from wrinkles and overhanging eyebrows. The wattles and ear-lobes fit close to the head and are not loose and flabby. The face is clean cut, the eye is full, round and prominent, especially when seen from the front. An eye

which gives a clean-cut, wide-open appearance is desirable. The eyeball of the heavy producer is generally set in the rear of a large oval socket, showing considerable of the white eye membrane in front of the eyeball.

The head of a heavy producer should be well balanced, being moderately deep and broad. The extremely fat, full head of the beefy bird and the long, thin, pointed head of the low-vitality bird are both undesirable, and should call for heavy cuts in this section. The low-producing bird generally shows a depressed eye with over-

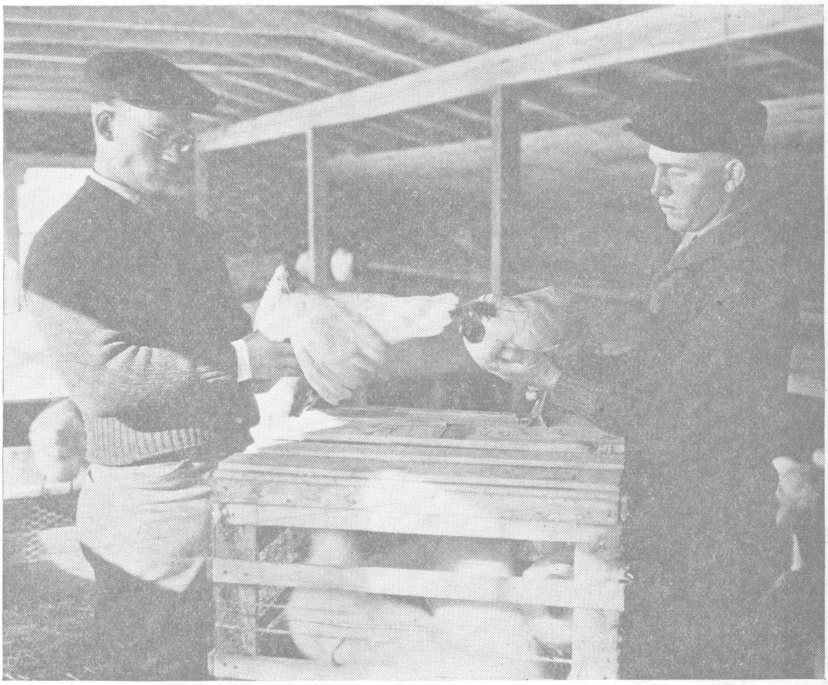

Fig. 6.—Selecting the birds for the show

hanging eyebrows and wrinkled skin at the back of the eye. The extremely long, sharp beak is usually possessed by a low producer, while the medium stout, well curved beak is characteristic of the high producer.

Body Conformation.—When taken in the hands, a heavy producer will show, by the sense of touch, great depth of body, especially at the front and rear of the keel bone. The keel must be moderately straight, relatively long, and carried well back. The space between the pelvic bones and the keel must be free from excessive accumulations of fat.

Condition.—A bird to be capable of highest sustained production must be first of all healthy. She must show vigor and activity and be well fleshed. Slow maturing birds, as shown by the primary feathers, should be cut severely. Late developing and late maturing usually indicate low production. In applying this section to hens, health and molting conditions should be given primary consideration. In applying this section to pullets, health and maturity should be given primary consideration.

PREPARATION FOR THE EXHIBIT

The head, shanks, and feet should be well washed with soap and water. It is usually a good idea to wash the whole fowl, provided care is used not to break any of the feathers, or get the bird chilled. The chilling can be prevented if the fowl is washed with warm, soapy water and carefully dried in a warm place.

Before drying, the birds should be rinsed with warm water twice, the second rinsing in water slightly cooler than the first. This will leave the feathers free from soap and will make the feathers lie better when dry. With white chickens, the last rinsing water can be very slightly colored with bluing, as this will keep the feathers from turning yellowish.

If these suggestions are followed carefully, it will add very materially to the exhibit. The club member should practice putting the chickens into the coop and handling them so that they will not be excited when the judge is examining them.

RECORDS AND STORY

VALUE OF ACCURATE RECORDS

A well kept record is the only record that is of any value to anyone. A club member who is careless about the record cheats himself. Club records are very often used to show to the farmers in a community the value of the good practices a group of members have followed. Every good business man keeps a financial record of his business, and the reason the poor business man often fails is because he never learned to keep a record.

THE STORY

Writing a story becomes difficult only when we try to imitate someone else. A story should be written in one's own words and writing. Practice on scrap paper first, then copy in the record book.

The points of a good story are: (1) Be yourself; (2) tell what you have done, not what you intended to do; (3) relate the unsuccessful experiences as well as the successful ones; (4) pictures and drawings help tell the story; (5) when you are through, quit.